

Scientific Inquiry

3-1 The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation.

3-1.4 Predict the outcome of a simple investigation and compare the results with the prediction.

Taxonomy Level: 2.5-B and 2.6-B Understand Conceptual Knowledge

Previous/Future knowledge: In kindergarten (K-1.3), students predicted and explained information or events based on observations or previous experience. In 2nd grade (2-1.4), students inferred explanations regarding scientific observations and experiences. In 4th grade (4-1.4), students will distinguish among observations, predictions, and inferences. In 6th grade (6-1.2), students will differentiate between observation and inference during the analysis and interpretation of data.

It is essential for students to predict the outcome of a simple investigation and compare the result with the prediction.

- A *prediction* is an idea about what will happen in the future with an explanation of why. A prediction is not a guess.
- A prediction, which answers the question being investigated, should be given at the beginning of an investigation. It states the possible results of the investigation.
- After the investigation is completed, the results can be compared to the prediction to determine how close the prediction was to the results.

To make a *prediction*:

- Make observations and think about what is known about the object or event.
- Tell what will happen next.

NOTE TO TEACHER: Predictions should not be viewed as “right” or “wrong” but should be stated with a plausible explanation of why.

Scientific observations are made by using the senses or taking measurements. Making *observations* is a way of learning about the world around us.

- A *scientific observation* is one that anyone can make and the result will always be the same. For example, the animal is black, has four legs, and feels soft.
- An *unscientific observation*, or an opinion, is one that not everyone may agree on. For example, the dog is happy.
- Observing does not mean just looking at something. It involves the use of several or all of the five senses (seeing, hearing, smelling, touching, and tasting) using appropriate observation methods for each sense, such as wafting an odor so that its smell can be described or gently touching the edges of seashells to determine their textures.
- Tasting in science should only be done with the permission of the teacher under controlled conditions.
- Observing helps to find out about objects (their characteristics, properties, differences, similarities) and events (what comes first or last, or what is happening at a particular moment).

It is not essential for students to identify the variables in the investigation or that a hypothesis is a prediction that gives a relationship between the variables.

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Assessment Guidelines:

One objective of this indicator is to *predict* the outcome of a simple investigation; therefore, the primary focus of assessment should be to form an idea of an expected result based on observations or experiences. However, appropriate assessments should also require students to *infer* the outcome of a simple investigation; or *identify* observations used to formulate why a prediction is being made.

Another objective of this indicator is to *compare* the results of the investigation with the prediction; therefore, the primary focus of assessment should be to tell how the results were similar to or different from the prediction. However, appropriate assessments should also require students to *infer* from the results to make further predictions, or *interpret* data collected from the investigation.